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PATENT SPECIFICATION

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Application Date: June 21, 1932. No. 17,514/32.

388,638

Complete Accepted: March 2, 1933.

COMPLETE SPECIFICATION:

Respiratory Mask.

I, JOSEPH EDOUARD LEDUC, British subject, of 516, Bloomfield Avenue, Outremont, Quebec, Canada, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to improvements in respiratory masks particularly adaptable for use by surgeons and physicians.

An important object of the invention is the provision of a germ proof mask designed to be comfortably fitted over the mouth and nose of a wearer.

A further object of the invention is the provision of a mask constructed so as to obviate passage of organisms therethrough during prolonged periods of conversation.

Another object of the invention is the provision of a mask of the above type designed so as to practically eliminate fogging of lenses of those using the mask and wearing glasses.

Still another object of the invention is the provision of an orinasal mask which will not be unduly warm and which can be manufactured at a relatively low cost.

Other objects and advantages of the invention will become apparent as the description progresses.

According to the invention the mask is built around a frame piece of cardboard, celluloid or like material, and comprises a flexible cover of gauze or fabric of larger area than the frame piece and having its marginal portions folded back over the frame piece to form chambers for the reception of loose fibrous filtering material and means connected with the frame piece to hold the mask in position on the wearer. The invention may also be characterised by a cup-shaped frame piece, by fibrous material in the form of balls, and by the several other features of construction hereinafter set forth.

In the accompanying drawings forming a part of this specification and in which like reference characters are employed to designate corresponding parts throughout the same:

Figure 1 is a perspective view of the mask properly fitted over the nose and

mouth of a wearer,

Figure 2 is an exterior elevational view of the assembled mask,

Figure 3 is an interior elevational view of the same,

Figure 4 is an enlarged transverse section taken on the line 4—4 of Figure 2,

Figure 5 is a similar section taken on the line 5—5 of Figure 2,

Figure 6 is a plan view of the inner side of the mask frame piece,

Figure 7 is an enlarged fragmentary section taken on the line 7—7 of Figure 6,

Figure 8 is a plan view showing the initial assembly of the mask structure,

Figure 9 is a similar view showing an advanced assembly of the mask,

Figure 10 is a perspective view showing a final assembly operation,

Figure 11 is an enlarged transverse section taken on the line 11—11 of Figure 10,

Figure 12 is a plan view of one of the filling elements,

Figure 13 is a transverse sectional view therethrough,

Figure 14 is a perspective view of a modified form of filling element, and

Figure 15 is a transverse section therethrough.

Referring to the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention, the numeral 20 generally designates the frame piece of the mask which is preferably formed of relatively stiff material such as cardboard, celluloid or the like. The frame piece 20 is provided with a centrally disposed oval shaped section 21 which is stamped or indented in order to form, at the inner side, a series of transversely elongated shallow pockets 22.

At spaced positions, the frame piece 20 is cut at the edge of the center section 21 to provide tapering slots 23 and arcuate cut lines 24, and is scored at the upper side portions as indicated at 25, to facilitate shaping of this piece. In the upper portion, the margin of the frame piece 20 is stamped to provide a nose accommodating indentation 26. At the ends, the piece 20 is provided with four apertures

27, the edges of which are raised to form spacing projections, these projections being adapted, in a pair of co-operating apertures, to contact with each other and leave an air space between the contacting frame piece 20 upon folding the mask.

Over the exterior surface of the central section of the frame piece, I apply a coating of wax, collodium or other suitable adhesive indicated at 29. Upon the inner edge margin I also apply a marginal coating of similar adhesive, indicated at 30. A sheet of covering material, preferably gauze, indicated at 32 is then properly positioned over the frame piece, the sheet entirely covering the outer surface of the frame and being fastened thereto by the adhesive coating 29. As shown to advantage in Figure 8, the gauze sheet is folded over the margins of the frame so as to assume a doubled position thereon.

The folded covering sheet also encloses a pair of strings or tapes 34 previously laid upon the frame piece about the edges of the center section as shown to advantage in Figure 8 and having the ends extended through the eyelets 27.

The edges of the folded sheet are gathered and firmly pressed unto the marginal coating of adhesive 30, as shown to advantage in Figures 4 and 5. A second marginal coating of adhesive 35 is then applied over the fastening margin of this sheet and a relatively rigid oval-shaped member 36 secured thereon. The member 36, which may be formed of pressed cotton or other suitable material, is adapted to provide a baffle to be disposed directly in front of the mouth of the mask wearer and is formed with a relatively large central opening 37 and a series of smaller openings 38.

After thus assembling the elements of the mask the tapes 34 are grasped at the ends and drawn outwardly to effect an initial tightening adjustment causing contraction of the inner portion of the covering sheet, as shown in Figure 4, and forming marginal chambers in the covering material. The chambers formed between the folded portions of the covering are loosely filled with filling elements preferably embodying balls of absorbent cotton or other suitable material indicated at 40 and shown at Figures 12 and 13. These balls may be formed by stamping or cutting out portions of a sheet of absorbent cotton and they are preferably inserted into the chambers of the mask by blowing in in order that they may be loosely positioned, yet effectively distributed.

A modification of the filling medium, shown at Figures 14 and 15, embodies

a cylindrical roll of absorbent cotton indicated at 42, punched or otherwise treated to form therein a series of apertures. These rolls may be positioned in the covering sheet during the folding of the sheet.

As shown to advantage in Figures 2 and 10, the end extensions of the strings 34 are preferably trained through cylindrical rings 43 designed to enable proper contraction of the mask and attachment thereof to the head of the wearer. Thus, when the mask is to be applied, the end portions of the strings are drawn laterally, causing contraction of the covering sheet and bending the frame into a substantially cup-shaped configuration so that the mask will be snugly fitted to enclose the mouth and nose of the wearer. The edges of the frame are preferably of undulatory contour designed so as to be snugly fitted upon the face and provide a tight covering about the nose and mouth.

With the present construction, any germ organisms issuing from the nose or mouth of the wearer will be collected within the mask. Organisms ejected from the mouth will impinge initially upon the baffle member 36 although parts thereof will be discharged through the apertures therein and collected in the indentations 22 in the center plate of the frame. The loosely stuffed marginal portions of the mask will obviate the discharge of organisms about the top, bottom or sides, inasmuch as the absorbent filling will act as a filtering medium. In consequence thereof, the mask provides a highly efficient respiratory device greatly desired for many purposes and particularly for surgeons during operation work in order to reduce to the greatest possible extent the danger of infection.

It is to be understood that the form of my invention herein shown and described is to be taken as a preferred example of the same, and that various changes as to the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A respiratory mask comprising a frame piece of stiff material such as cardboard, celluloid or the like, a gauze or fabric cover of larger area than the frame piece and having its marginal portions folded back over the frame piece to provide chambers for loose fibrous filtering

elements, and means connected with the frame piece to hold the mask in position on the wearer.

5 2. A respiratory mask according to claim 1, wherein the frame piece is adapted to assume a cupped form.

10 3. A respiratory mask according to claim 1, wherein the frame piece of rigid material is cut to enable cupping thereof, and wherein a perforated baffle member is secured centrally to the inner face of the frame piece and cover.

4. A respiratory mask according to

any of the preceding claims wherein the filtering elements consist of balls of 15 absorbent fibrous material loosely disposed therein.

5. A respiratory mask constructed, arranged and adapted for use substantially as herein described and illustrated. 20

Dated this 20th day of June, 1932.

For the Applicant,
WILSON, GUNN & ELLIS,
Chartered Patent Agents,
55, Market Street, Manchester.

Fig. 1

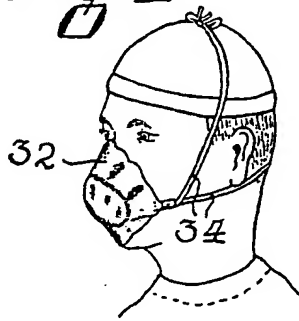


Fig. 2

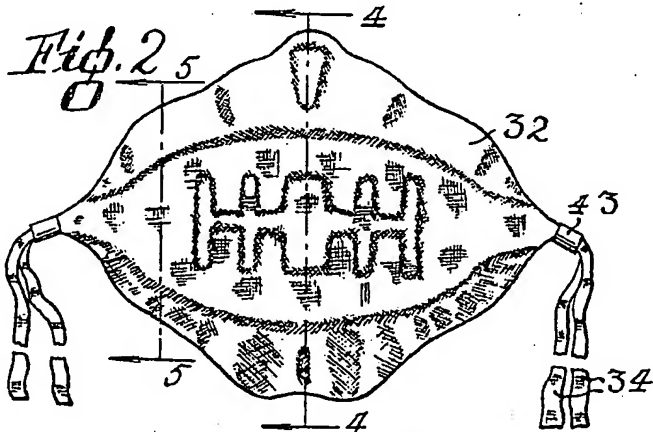


Fig. 4

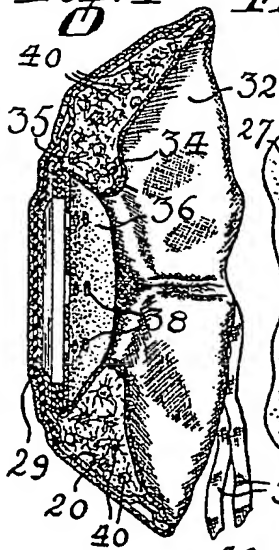


Fig. 6

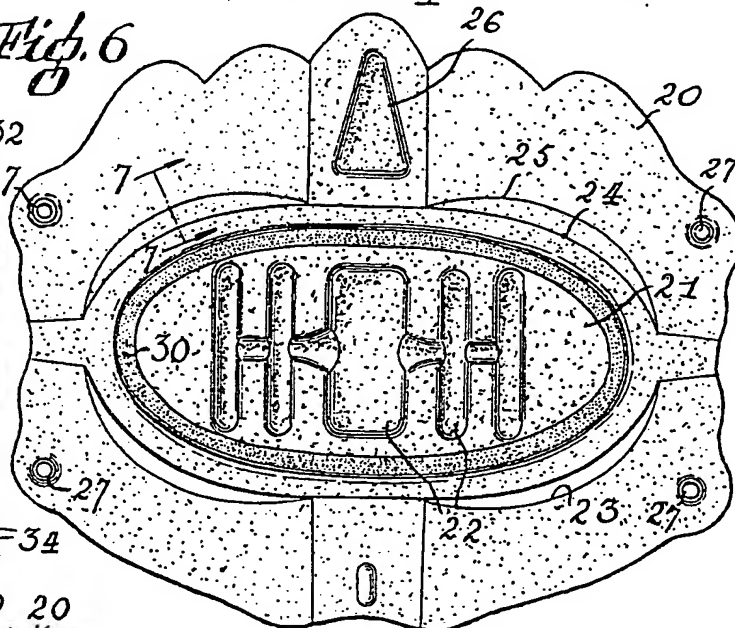


Fig. 5

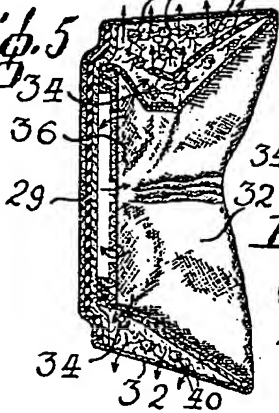


Fig. 3

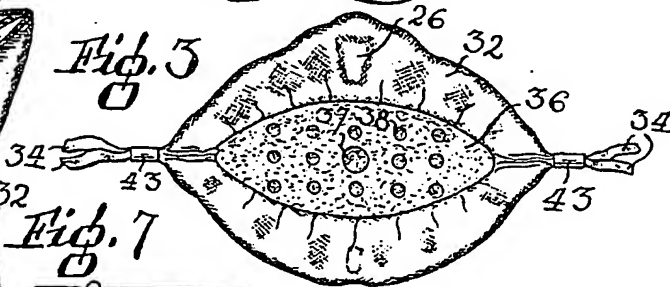
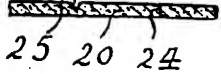


Fig. 7



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Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 8

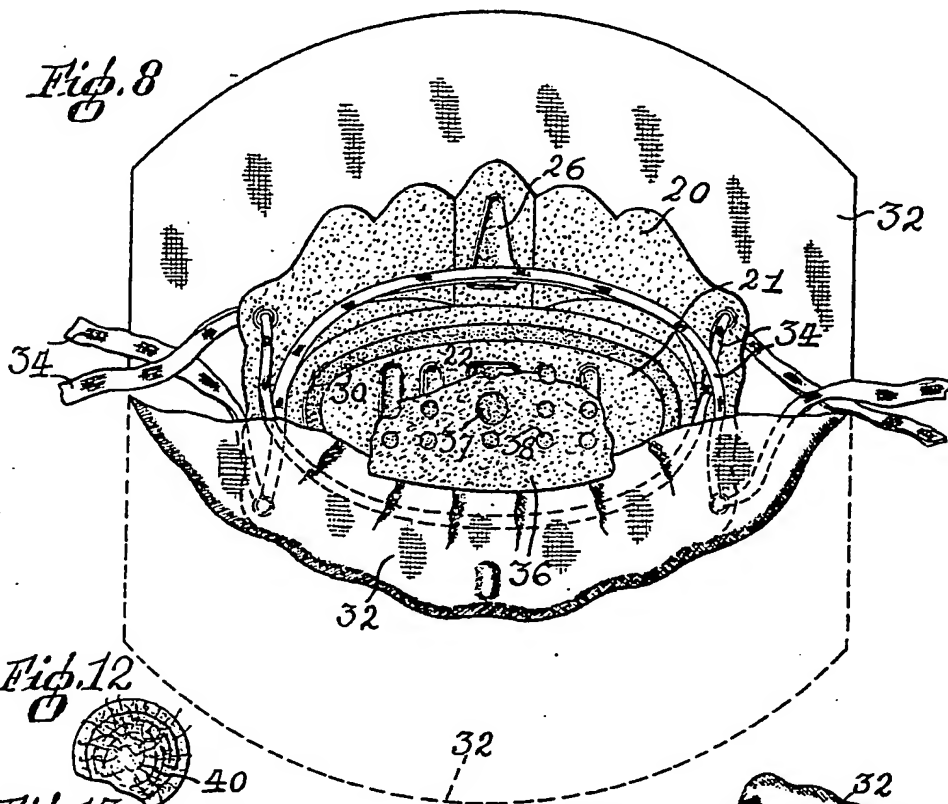


Fig. 12



Fig. 13

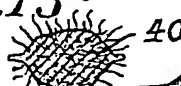


Fig. 9

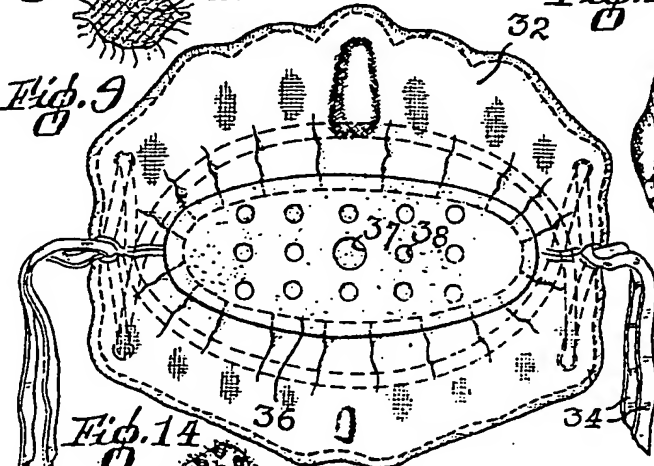


Fig. 10

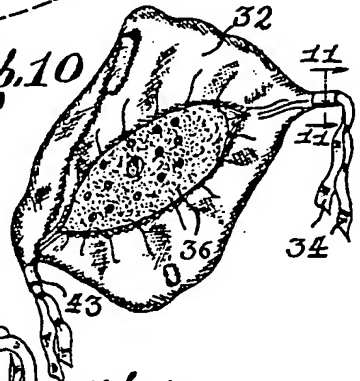


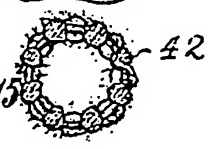
Fig. 11



Fig. 14



Fig. 15



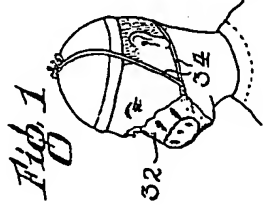


Fig. 1

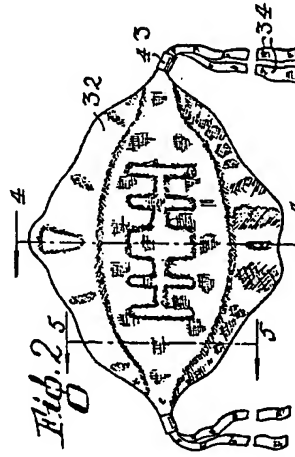


Fig. 2

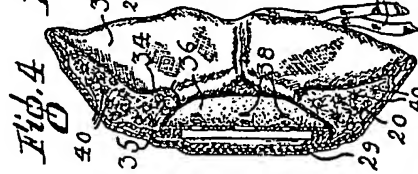


Fig. 4

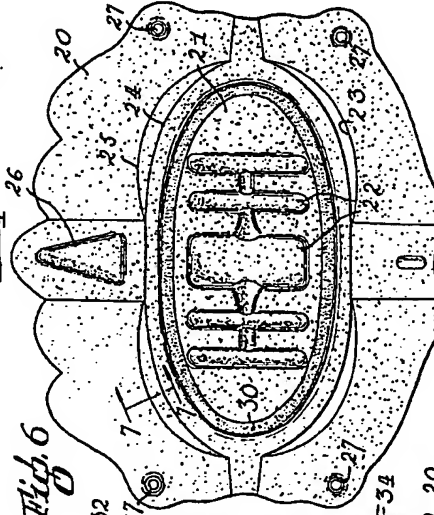


Fig. 6

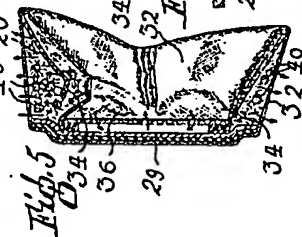


Fig. 5

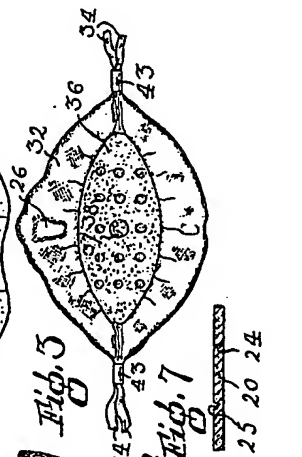


Fig. 3

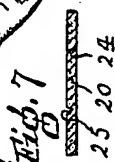


Fig. 7

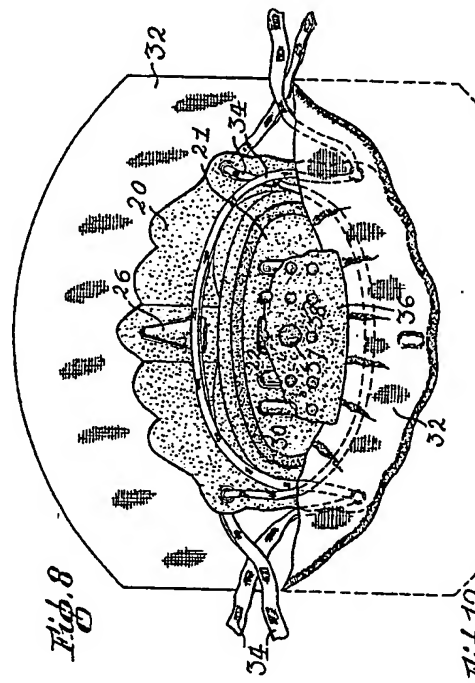


Fig. 8

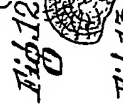


Fig. 12



Fig. 10

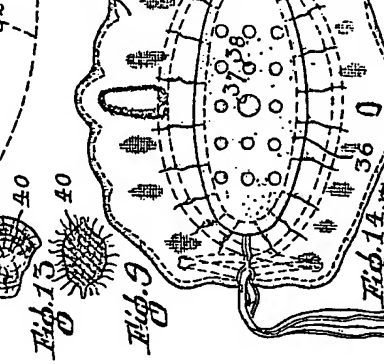


Fig. 9



Fig. 11



Fig. 14



Fig. 13

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